National EPA-Tribal Science Council (TSC) Spring 2012 Meeting

Grand Sierra
2500 E Second Street
Reno, NV 89595

June 12 – 14, 2012

MEETING SUMMARY

Tuesday, June 12, 2012

Welcome, Invocation, Introduction of New Members and Overview of the Meeting

Bear Carrillo welcomed the participants to the meeting, and John Mosley provided the invocation. Bear explained that Ted Coopwood was unable to attend the first day of the meeting, so Beth Jackson served as acting EPA Co-Chair in his absence. After the TSC members and guests introduced themselves, Bear provided an overview of the day's agenda.

Jeff Mears noted that since the TSC established the National Tribal Science Priorities (TSPs), he had seen many connections between traditional ecological knowledge (TEK) and climate change, indicating that the TSC chose the two most appropriate priorities on which to focus its efforts. He mentioned several workshops related to TEK and/or climate change, including: (a) Region 10 Leaders Summit, (b)Institute for Tribal Environmental Professionals' (ITEP) climate change adaptation planning meeting with the Oneida Tribe, (c) workshop in Michigan sponsored by the Bureau of Indian Affairs (BIA), and (d) the First Stewards Symposium. Jeff stated there are many tribes performing beneficial work with respect to climate change, including the Grand Portage Chippewa. This tribe is dealing with a disappearing moose population by focusing on an alternative species (deer) with a science-based method. Instead of focusing on climate change mitigation, which already is too late, the tribe is placing emphasis on climate change adaptation. Jeff added that in order to set itself apart from other efforts, the TSC must set up a science-based approach to move forward with its TEK and climate change TSPs.

Beth thanked John for hosting the meeting and the TSC members for the work that they had performed prior to the meeting to help make their time together the most productive that it could possibly be. She noted that there will be the opportunity to revisit Administrator Lisa Jackson's support for the TSPs at the National Tribal Operations Committee (NTOC) meeting in July 2012, allowing the TSC to demonstrate the progress it has been made in the early stages of the process during the past year. Beth emphasized it is more important to focus our attention on the Administrator's support in terms of leveraging available resources in the current economic climate rather than a deadline.

Revision of TSC Overview Document

Dennis O'Connor provided background about the TSC Overview Document, explaining that when the TSC was formed, the members had improvised during the first 2 to 3 years of operation until they had decided that they needed to develop a charter for the TSC. The resulting TSC Overview Document was a collaborative effort between the Tribal and EPA Caucuses. The current effort has been to reassess and update the document to ensure that it reflects where the TSC is now. Dennis explained that Ted had led the EPA Caucus discussions of the document. The general principles still stand; the document was built on the foundation of collaboration between EPA and the tribes to examine the intersection and integration of EPA and tribal science. Bob Hillger added that the TSC is designed to be tribally driven. The key factor is that tribes work to inform the Agency about their environmental needs and priorities.

The TSC members discussed the revisions previously made to the document by both Tribal and EPA Caucuses.

David Charters asked which entity would be approving the finalized document. Monica Rodia explained that the Office of Research and Development (ORD) will attempt to obtain buy-in from the Agency. Dennis said that the original document was approved by the Tribal and EPA Caucuses; neither caucus had thought that there was a need for higher level approval. Monica stated that she had communicated to her management that it should be approved internally by the TSC, but management thought that Agency approval would be beneficial. Bear said that it would be constructive to report to management that the TSC members agreed that it should be internally approved. John (Mosley) suggested that the NTOC should be provided an opportunity to view the changes to the document.

IMPLEMENTATION OF NATIONAL TSPS

EPA Caucus Presentation: Opportunities for Agency Implementation
Beth Jackson, EPA, Office of Environmental Information

Beth explained that to support the transition to implementation of the TSC-identified TSPs, EPA had completed an Agency-wide inventory of programs and activities related to the priorities with the goal of building the knowledge and capacity to strengthen internal and external cooperation as well as to better respond to requests from the tribes. Program and regional offices were asked to identify activities relevant to TEK and climate change in the categories of research; education, outreach and training; and technical assistance. These categories were derived from the specific requests from the tribes in their TSP writeups. Many offices across the Agency responded to the request, highlighting a wide range of case studies and opportunities for implementation, leveraging and expansion of efforts.

Agency support for TEK took on four broad themes: (1) protection of culturally important species, (2) identification of unique exposure pathways to inform risk assessment, (3) incorporation of oral history and scientific data into water quality standards and National Pollution Discharge Elimination System (NPDES) permitting, and (4) creation of a tribal-specific environmental protection process.

Jeff thought that it was premature to ask EPA how to support TEK when the TSC had not yet defined TSP implementation. Monica explained that the inventory effort from EPA regions and programs was based on input received from the tribes during the priority setting process last year. Brenda Groskinsky said that it had been difficult to identify how Region 7 currently supports TEK. Kathy Mayo stated that Region 5 viewed it as a two-prong question: (1) how to support the tribes and (2) how to integrate this support into its programs.

Beth highlighted specific projects throughout the regions integrating TEK. A few examples include assessment of riparian properly functioning condition, prioritization of cumulative risk from underground storage tanks, and several projects focusing on the protection of culturally important species protection. Many activities focus on climate change activities, including development of impact and vulnerability assessment and adaptation strategies, incorporation of climate change considerations into core water programs, and data collection and monitoring.

In response to a question from Bob Hillger, Monica explained that the list of activities presented was for example only and not all inclusive.

The Office of Air and Radiation's Climate Showcase Communities Program supports several tribal projects focused on energy efficiency, climate assessment and emissions. Bob Hillger asked why the projects seemed to focus on western states. Dennis explained that it was a competitive grants program, and the proposals from the West were selected for funding. Jeff asked whether the projects focused on

adaptation or mitigation. Beth and Dennis responded that it was a mix of both. Dennis added that his office's website has more detailed descriptions of the projects.

Curtis Munoz said that some of the Kiowa Tribe projects utilize U.S. Department of Energy funds rather than EPA funds. Funds from other agencies can be used to implement climate change adaptation strategies. Denise Jensen said that there is a mining issue in Bristol Bay (Alaska), and EPA considered TEK in its report on the matter. Tia Chullakorn said that many of the tribes use non-EPA resources to address climate change and that there is a great deal of competition for funding. Additionally, some TEK activities are not allowed under EPA General Assistance Program (GAP) funding. Neil Patterson added that GAP guidance regarding how the tribes can manage their specific GAP programs is important. Because it is impossible to know the environment if the tribe does not know its language, he would like more latitude within GAP to fund language and TEK activities. The Tuscarora integrated language classes because it is the most important capacity-building activity that can be undertaken; this is an example of a success story that must be shared. Beth said that it would help other tribes to hear success stories. Scott Clow said that EPA must make a decision about GAP program capacity and cessation of funding. The NTOC has submitted a request to Congress, stating that more diverse tribal implementation funding is needed. Climate change is the future of uncertainty, and it is unrealistic for EPA to tell the tribes to develop programs but "draw the line" at a certain point in this development. There must be maximum flexibility regarding language, education and programs to implement TEK to address climate change. Neil agreed and said that issue statements need to be living documents. The TSC should be an advocate for increased GAP flexibility or multimedia grant funding. He would like success stories added to the issue statements.

Beth highlighted that there are ongoing TEK activities addressing tribal research questions. These included support for tribal language fluency and its association with TEK as well as culturally based environmental regulations integrating TEK. Some examples of these activities include protection of culturally important species, informing risk assessment using unique exposure pathways, incorporation of oral history and scientific data into water quality standards and NPDES permitting, and creation of a tribal-specific environmental protection process. In addition, there are TEK activities linked to tribal requests for education, outreach, training and technical assistance. These requests included coordination with the tribes to develop TEK sensitivity and policy training for EPA personnel and an EPA presence for TEK on the Web. Related activities include development of various communication vehicles to create collaborative understanding (e.g., TSC TEK webinar series and planned workshop) and coordination with the U.S. Fish and Wildlife Service's (USFWS) TEK program.

Bob Hillger said that the direct connections between the specific tribal requests and EPA responses were not clearly illustrated in the PowerPoint presentation. Beth said the PowerPoint would be improved to better illustrate the connections.

Beth reviewed the EPA climate change activities linked to tribal requests in terms of research. The tribal requests included establishment of programs that recognize the variability of climate change issues among tribal communities and documentation of impacts on Native American and Alaska Native communities and their ecosystems. EPA's related activities include research on tribal health and the environment under the Science To Achieve Results grants program, waste diversion and management activities, and data collection and monitoring. Tribal requests in the area of education, outreach and training included adaptation workshops and courses, education curricula, opportunities to connect the tribes with other federal agencies, and communication of issues and training using tribal-specific and culturally sensitive methods. EPA's linked activities include development of youth curricula, sponsorship of adaptation workshops and speaker series, and the creation of the EPA Climate Change Adaptation Plan.

Tribal requests in the area of technical assistance for climate change include access to experts and the most current and relevant science, promotion of the science of data to ensure legally defensible evidence to support natural resources, and methodologies and tools that include climate change approaches in grant applications. Activities within the Agency linked to these requests include the development of the Tribal-Focused Environmental Risk and Sustainability Tool and establishment of the Tribal ecoAmbassador Program and Pediatric Environmental Health Specialty Units.

Monica clarified that the PowerPoint was used to illustrate some examples from the inventory that the EPA program and regional offices were doing to categorize activities related to climate change and TEK. The inventory is by no means complete and an ongoing process.

The effort to determine what tribal activities the Agency was undertaking sheds light on common themes across media and geographical areas, builds understanding of specific projects addressing the priorities, and provides potential for leveraging and expansion. The TSC has emerged as a catalyst to encourage intra-Agency collaboration to address the TSPs. The basis for an infrastructure for improved communication is in place as a result of strengthening the partnerships that reach across offices, regions, agencies, sectors and nations.

David C. said that it was important to note that most of the activities had not been implemented as a direct result of tribal requests and TSC activities; many have been ongoing for years. He added that the TSC must explain clearly that it is communicating Agency efforts. Beth agreed and said that specific program and regional information was included in parenthetical notations.

Jeff reiterated that this survey was conducted out of order before the TSC could frame implementation for addressing TEK and climate change. Beth explained that these examples could be the basis for the ongoing work and options for leveraging resources.

Bob Hillger thought that the goal was to determine how the tools could support the tribes. Bear explained that this effort had brought activities to light and provided a basis for moving forward with synergistic efforts. Dennis said that the TSC provides a forum to discuss tribal issues, communicate with the tribes and allow programs to communicate with each other by breaking down internal barriers. This process is valuable to informing programs and regions.

Patti Tyler wondered about the next steps. She thought that it is necessary to ensure that the goal is clear and well communicated. Denise said that she would like to send this presentation to the Region 7 Regional Tribal Operations Committee (RTOC) and tribes to determine whether they are interested in more details about these programs and projects and whether there is a way to implement them into their programs. Bear reminded the members that there may be many activities not included in the presentation. This is an approach on which to build.

David C. reiterated that the emphasis needs to be placed more on “activities” rather than “responses”; it is confusing to frame the activities as responses to tribal requests rather than as related activities. It is important to communicate to the tribes information about activities related to climate change, risk assessment etc. that EPA is undertaking. Communication is the key to moving forward.

Approaches, Partners and Coordination Efforts in Indian Country
Tia Chullakorn, Kashia Band of Pomo Indians of the Stewarts Point Rancheria, and the Pyramid Lake Paiute Tribe Environmental Department

Tia described a tribal Clean Water Act Section 106 pilot project, explaining that water is life, especially to the tribes. Because water is an essential component of survival, the health and quantity of water is important. In the West, many entities fight for water, and many communities recycle their water. Water is sacred to the tribes, and many include it in their ceremonial activities. If the water is not healthy, the people are not healthy. She explained that bioassessment, in terms of this project, is the use of benthic biological community information with the measure of physical habitat to determine the integrity of water bodies. Biological integrity is defined as the ability of an aquatic ecosystem to support and maintain a balanced, integrated, adaptive community of organisms having a species composition diversity and functional organization comparable to that of the natural habitats of the region. The most sensitive, vulnerable organisms will die, so it is necessary to ensure a healthy habitat.

The "stream team" that carried out the project was composed of members from multiple tribes, and each tribe shares its knowledge. The team examined the river banks, assessed the health of nearby native and invasive trees, and observed the water system as a whole. The team photographed the site so that the photographs could be compared to past and future photographs. Many parameters of the river water were measured, including temperature and pH. Tia highlighted photographs of insects and eels found in the river. Although the river no longer has salmon, the eel are an indicator that the salmon will return; this is an example of local TEK. The next generation already is looking at caring for the water in the river in terms of improving it rather than just mitigating; this generation provides a different perspective when their views are combined with the elders' TEK. The tribal members perform their analysis at an improvised laboratory, using living organisms for the analysis rather than chemical analysis because it is less expensive. The youth accompanied their parents to the laboratory, drawing pictures of the organisms, which will be saved for the next generation. The tribal members assessed the information that the analysis provided to determine how the river has been impacted.

The tribes have been using TEK to manage their environment for millennia. They manage natural resources on a sustainable level, using natural forces (e.g., fire, weather and vegetation) to manage resources to their advantage. In the past, the tribes generally recognized when resources were becoming scarce and moved to new areas, limited harvests and/or changed practices. Traditional resource management techniques included burning, irrigating, pruning, sowing, tilling and transplanting. Tia showed a diagram of the natural cycle that highlighted various management and nonmanagement practices and their effects on the cycle; without employing management techniques that mimic natural disturbances (e.g., flooding, lightning fires), the cycle takes longer. For example, a shrub's lifespan may be shortened in the absence of disturbance, quickly making it unsuitable for use in basketry. TEK fuses the methodologies of anthropology and biology to underscore the past and current relationships between nature and culture.

The tribes use TEK in the modern age, too. Agricultural techniques and products based on indigenous knowledge are being marketed widely, including permaculture, water harvesting, soil conservation, fire management (controlled burns), botanical medicines, handicrafts, heirloom grains and vegetables, and so forth. For example, the Pinoleville Band of Pomo Indians has created culturally inspired and environmentally sustainable designs for their tribal housing in coordination with the University of California, Berkeley. The Ramona Band of Cahuilla Indians has instituted an ecotourism project and is one of the first tribes to be "off the grid." The Kashia Band of Pomo Indians of the Stewarts Point Rancheria has powered all of the tribe's street lights via wind and solar energy. The region has a great deal of ongoing, environmentally sustainable TEK projects and is establishing an environmental youth camp. Environmental efforts in Indian Country cannot proceed without acknowledgment of the culture.

Storytelling is the best method to communicate past science to the next generation; this is a very important tradition that cannot be lost.

Denise asked during which season(s) the team carries out the bioassessments. Tia responded that bioassessments are performed when there is rain because the river does not always have water. Bob Hall said that the index period for collecting, which is controlled by latitude, usually occurs in Southern California and Nevada in April or May and then migrates north, so that some collection occurs during July and August.

Tom Baugh asked how the early tribal members dealt with water storage. Tia said that there was limited opportunity for water storage, so the tribes relocated to where water could be found. Over time, water that once existed has permanently vanished. Tom asked whether the tribes attempted to build methods to move water. Bob Hall responded that the Tohono O'odham Nation based its whole culture on moving water. There are examples of tribes that moved into the mountains on a seasonal basis to be near a water source. Tia added that the weather also dictates tribal movement. The tribes frequently changed surface waters through various methods, such as rock dams.

Breakout Session: EPA Caucus Training on Indians and the Environment: Indian Law Principles Part II

The EPA Caucus members received the second part of their Indian law training from Aurene Martin and Hope Johnson of Native American Consulting.

Breakout Session: Tribal Caucus Business Meeting

Bear began the session with a "check-in" period so that the Tribal Caucus members could express any concerns that they had before discussing the plans for the TEK workshop. Jeff thought that TSC decision-making needed to include the Tribal Caucus. For example, the Tribal Caucus was not afforded the opportunity to choose the consulting group that provided the Indian law training to the EPA Caucus; a consultant near the meeting location should have been chosen instead of paying for consultant travel from Washington, D.C. Jeff also had not been invited to present the TSPs at the NTOC meetings in July of 2011 and 2012. Considering the EPA presentation that morning, Jeff did not understand why EPA consulted the offices and regions about their TEK activities without informing the Tribal Caucus first. The Tribal Caucus has not developed a vision for implementation yet, so it seemed premature to survey the regions and offices.

Bear said that these concerns could be addressed by strengthening the decision-making process described in the TSC Overview Document; the instructions in the document can be made so that decision making is more tribally driven. Tia said that, in terms of the survey of the regions and offices, the TSC must show progress regarding TSP activities at the NTOC meeting the following month. She commented that the tribes need many tools; what EPA has done so far is only the beginning and represents a small percentage of what the tribes need. John commented that there are no measurable outputs and outcomes; EPA should commit to these measures.

Bear stated that the right language was needed to ensure that the right groups are included in the decision-making process. The TSC Overview Document has been written from a different perspective; the Tribal Caucus has the opportunity to rewrite it and put it in a form that is more representative of what it should be. The Tribal Caucus members must ensure that the TSC Overview Document represents the goals and desires of the Tribal Caucus. Regarding implementation of the TSPs, the TSC's job is to provide the information to those who will be implementing the activities. Jeff reiterated the need to ensure that the TSC is tribally driven. Bear noted that all regions and offices within EPA have a mandate that they are required to complete, which is what drives the EPA Caucus. The TSC only recently was recognized by

the NTOC as an important part of the process; progress is being made, even if the process is not perfect at this point. The Tribal Caucus is responsible for communicating its issues to the EPA Caucus; Bear encouraged the Tribal Caucus members to express what they think and feel to their EPA colleagues. The more the tribal members direct the actions of the TSC, the more tribally driven it will become. It also is important to understand each other's cultures. The EPA Caucus needs training on the history of Indian Country; the members will not be able to understand tribal culture unless they have been taught the history.

John said that the Region 9 Regional Administrator (RA) has been making an effort to visit every tribe in the region; there are many tribes, but he has visited approximately one-third of them thus far. The RA attends the RTOC meetings as well. Region 9's nontribal EPA staff members make themselves available to the tribes. Although it is not perfect, EPA is trying to work with the tribes.

Jeff said that when the TSC is being represented, both TSC Co-Chairs should be present. During the TSP regional presentations in the previous year, Ted had been present, but Jeff had not. The funds that are offered to the Tribal Co-Chair to pay an assistant should be allowed to be used for more productive activities, such as travel to represent the TSC, but he had been told that they only can be used for an assistant. Bear said that it is necessary for the tribal members to voice their concerns so that they are heard. Jeff said that this requirement needs to be captured in the TSC Overview Document. Bear said that it had been difficult to review and update the TSC Overview Document during the Tribal Caucus monthly conference calls because of the lack of participation; all of the Tribal Caucus members need to participate.

The Tribal Caucus moved its discussion to the upcoming TEK workshop. According to the flyer that EPA developed to promote the TEK workshop, the suggested objectives of the workshop are to: (1) provide a forum to share scientific expertise and develop ways to integrate tribal and Western science; (2) educate EPA and other federal and state agencies about TEK; (3) develop strategies with TEK experts to enhance EPA operations and collaborations with tribal partners (e.g., climate change research and policy making, subsistence foods, traditional lifeways); (4) share TEK applications among the tribes to forge communities of practice; and (5) inform the tribes of tools and data available to assist in implementing TEK.

Jeff told the Tribal Caucus members that Jim Woods of the Makah Nation had offered to host the TEK workshop; the location would be just outside of Seattle, Washington. He said that the TSC had the opportunity to make this TEK workshop unique by basing it on science and the TSPs. Katie said that she still has contacts at Haskell Indian Nations University; Dan Wildcat would be an excellent presenter. Also, the Tribal Air Monitoring Support (TAMS) Steering Committee volunteered to form a subgroup to work with the TSC on the TEK workshop. Tia said that Humboldt State University is involved in climate change and TEK, but it is difficult to travel to the campus.

Jeff asked the Tribal Caucus members to consider a model for the workshop. Should the Region 10 experts be invited to other areas of the country to share their expertise with other tribes instead of trying to bring the other tribes to Region 10? What would best fit the budget? Bear said that Monica would build the budget around the needs of the workshop. The Tribal Caucus needs to determine the budget for the type of workshop that it wants to sponsor, and then Monica will find out whether she can obtain such a budget. The Tribal Caucus members need to determine a theme, content, target audience and so forth; determining who the workshop is for and why it is being held will determine how to make it happen. Jeff reiterated that the workshop needs to be made unique to the TSC; otherwise, there is no point in holding one. The workshop must provide tools to help the tribes. The tribes need to share and learn from each other about this new invading force—climate change.

Bear said that not every tribe has the same intellectual grasp of science or how to tie science to TEK. The workshop should teach the tribes to tie both together as much as possible. Jeff said that many tribes lost

the core of who and what they were because of relocation, including their TEK knowledge. It is important for the tribes to understand their own stories. Some tribes may be able to help bridge the gaps caused by events that other tribes experienced (e.g., relocation, the boarding school generation).

Bear asked the Tribal Caucus whether it wanted to sponsor a TEK meeting; the Tribal Caucus decided to move forward with the TEK workshop. Neil agreed with Jeff that the workshop needed to be unique to the TSC; the focus should be on the tribes sharing stories with each other, and EPA can learn from these stories. Scott said that TEK is tied to climate change. He noted that the term "global warming" had been changed to "climate change" and wondered whether there was a somewhat universal term in Indian Country that related to the massive destruction that the Europeans caused on the North American continent. If so, perhaps that term could be used for the workshop to set the TSC workshop apart from others. Jeff said that climate change is a more descriptive term. Native Americans are not responsible for it, so he did not want an Indian name associated with it. Neil agreed and put forth the question, "How does TEK promote cultural survival?" This is a better question than tying it to climate change.

John stated that the Paiutes had survived for 14,500 years, including through an ice age, so tribes do adapt. Jeff said that relocation as a means of adaptation was not a viable option anymore, which is why some tribes are extinct (e.g., Anasazi). He also noted that some ceremonies that usually are held at a certain time of the year must be held earlier; other changes (e.g., timing of maple syrup collection, morel mushroom gathering and sturgeon fishing) are occurring as well.

Bear said that the Tribal Caucus needed to determine when the workshop would be held. September and October are fast approaching, but Monica had mentioned the possibility of November. Tia thought that spring would be a better option, so that there is more time to plan. Kristen confirmed with Monica that the workshop could be planned for the spring.

Jeff thought it might be helpful to obtain a list of EPA-related TEK workshops. Tia said that most TEK workshops are sponsored by other federal agencies and not EPA. Neil said that the workshop needed to be focused on the tribes that want to rebuild their TEK.

John emphasized that the Tribal Caucus needed to better define TEK (i.e., what it is and what it means). Neil pointed out that the concept behind TEK is the relationship with the local environment, natural resources and landscape; it is not specific to culture, race or ethnicity. Other terms include "naturalized knowledge system" or "indigenous knowledge system." The term is inclusive rather than exclusive. Jeff noted that there is ongoing cultural development as the tribes learn about their new environment; the tribes can share this knowledge to help others with tribal adaptation. The workshop must promote networking among the tribes so that they can learn how others manage their resources and then apply it to their own situation if their resources are in decline. Bear said that the objectives that had been suggested are a starting point only; there could be a need for several workshops. The Tribal Caucus must decide the focus of the upcoming workshop.

Katie thought that Neil's suggestion about cultural survival as a theme was good. Curtis added that a focus could be how science has been applied for millennia. Jeff said that the Oneida Tribe has adapted many cultural practices that were not an original part of the tribe (e.g., sweat lodges, buffalo farming); the tribes can help each other by sharing these types of stories. Katie said that the Eastern Band of the Cherokee Nation (North Carolina) and the United Keetoowah Band of Cherokees (Oklahoma) meet twice a year to update their language.

Bear also stressed the importance of having a product developed during each workshop session. The presenters will not just present; together with the participants, they will create a useful product to bring home after the workshop ends and continue the work. Participants are more motivated to use the

knowledge from a workshop when they have been involved in creating something that they can use in their daily responsibilities.

In terms of the format of the workshop, Jeff thought that six presentations per day, three each in the morning and afternoon, would be a good amount. Of the 18 presentations, three should be from Alaska. He noted that he has not heard many stories from Eastern tribes, and this workshop would provide a good opportunity for them to share their knowledge and stories.

Bear asked whether each day of the workshop would have a theme. The Tribal Caucus decided on the following daily themes:

- **Day 1:**
    - ***Morning:*** *Cultural survival.* What is culture? Language, land-base and government are three critical factors that comprise a culture, although many other items may define a culture. Chiefs are entrusted to protect the genetics, geography and political system of their tribes. The TEK discussion should be brought to a larger biocultural forum. What does each component bring to cultural survival? How does EPA ensure that TEK is used by decision makers? The presenters should focus on these questions in their presentations.
    - ***Afternoon:*** *Invasive species/medicinal plants.*
- **Day 2:** *Cross-cultural connections.* The tribes will share stories about how they incorporated nontraditional resources into their cultures, including how relationships with other tribes influenced them.
- **Day 3:** *Available tools (e.g., standard operating procedures, management plans) and best management practices.* This will allow other tribes to learn what is available and apply the tools to their own situations.

The Tribal Caucus members chose the following objectives for the workshop:

- Share TEK applications among tribes to forge communities of practice.
- Inform the tribes of tools and data available to assist in implementing TEK.

An additional benefit of the workshop, although not an objective, is that EPA and other agencies (e.g., USFWS) will be educated about TEK.

The Tribal Caucus members developed the following list of potential locations:

- Eastern tribal locations
- Haskell Indian Nations University
- Washington State (Jim Woods as contact)
- The College of Menominee Nation
- Eastern Band of the Cherokee Nation (Cherokee Language Immersion Academy)

The Tribal Caucus members offered the following individuals as potential presenters:

- TSC members:
    - Neil
    - John
    - Curtis

- Tribal elders/experts:
  - Oren Lyons
  - Dan Wildcat

- Institute for Tribal Environmental Professionals (ITEP):
  - Melinda Ronca-Battista

- Tribal Air Monitoring Support (TAMS) Center:
  - Rose Lee
  - TAMS also has volunteered to help the TSC plan the workshop by developing a subgroup to work with the TSC.

- United South and Eastern Tribes, Inc. (USET):
  - This resource can be used to help identify tribal elders.

- Researchers from tribal colleges and universities (TCUs) and tribal natural resources departments:
  - Seth Moore, Grand Portage Band of Lake Superior Chippewa
  - Robin Kimmerer, Citizen Potawatomi Nation/State University of New York College of Environmental Science and Forestry
  - Mike Turcotte, Fort Peck Community College
  - Wilbert Fish, Blackfeet Community College
  - Darlene Johnson, Fort Peck Community College

- Indigenous language experts:
  - Darrell Kipp, Blackfeet Tribe.
  - Rinessa Walker, Cherokee Language Immersion Academy.
  - Gil Jackson, Cherokee Language Immersion Academy.

- USFWS:
  - Kim Greenwood

Day 1 Wrap Up

Jeff provided highlights of the Tribal Caucus discussion regarding the planned TEK workshop to the EPA Caucus. The Tribal Caucus members thought that instead of trying to rush to develop a workshop by the fall, it was better to hold the workshop in the spring of 2013. The theme is "How does TEK promote cultural survival?" The objectives are to share TEK applications among the tribes to forge communities of practice and inform the tribes of tools and data available to assist in implementing TEK. An additional benefit of the workshop will be to educate EPA and other agencies (e.g., USFWS) about TEK.

The agenda will include six presentations per day for the three days, including three presentations from Alaska. The morning of Day 1 will focus on cultural survival (land, language, government), and that afternoon will focus on invasive species and medicinal plants. Day 2 will focus on cross-cultural connections (baskets, buffalo, wild rice), and the theme of Day 3 will be available tools and best management practices. Each session will result in a product that the participants develop. Potential locations include Washington State (Jim Woods of the Makah Nation as volunteer host); Eastern tribal lands (providing a new opportunity to learn); and TCUs (e.g., Haskell, Cherokee Language Immersion Academy). Potential presenters include: John, Neil, Curtis, Oren Lyons, Dan Wildcat, ITEP, USET, researchers from TCUs, indigenous language experts and USFWS.

Bob Hillger asked why Alaska was specifically mentioned. Jeff explained that Alaska Natives have notable expertise in this area, and the Tribal Caucus wanted the workshop to capture this knowledge. He added that there is a wealth of cultural knowledge on the East Coast that has not been explored.

Monica stressed the need to confirm the dates so that the workshop can be placed on the EPA American Indian Environmental Office (AIEO) Tribal Portal and calendar because there are many other meetings during the spring. Brenda stated that Region 7 recently had signed a Memorandum of Understanding (MOU) with Haskell, so there might be a mechanism in place to hold the workshop at the university. Denise said that the workshop should be interactive and collegial; it should be a mechanism for the tribes to learn from each other. Bear noted the workshop template in which each session would produce an output (e.g., plan of implementation). Bob Hillger suggested that a TEK poster session be part of the agenda.

Before Bear recessed the meeting at 4:23 p.m., Monica reminded the members to send her their travel vouchers for the meeting via email.

Wednesday, June 13, 2012

Day 1 Recap

Bear called the meeting to order at 8:10 a.m. Jeff said that the TSC Overview Document needed to state explicitly that both Co-Chairs need to be present when representing the TSC. At the very least, the TSC Tribal Representative from the region in which the NTOC meeting is being held needs to attend that meeting. In response to a question from Patti, Jeff explained that no TSC Tribal Representative would be present during the upcoming July 2012 NTOC meeting. David C. wondered why EPA was presenting to the NTOC. Monica responded that the decision for who would present on TSPs will be made by Office of International and Tribal Affairs (OITA) or JoAnn Chase (Director, AIEO). OITA and AIEO are leading the development of the presentation with the TSC's input. Beth said that Administrator Jackson presented the TSPs to the NTOC in July 2011. She didn't know whether there was any funding available for non-EPA TSC members to present; if funding is available, she agreed that the Tribal Co-Chair should attend.

Bear asked how the decision is made regarding who will present or be invited to attend the NTOC meeting. Monica said that AIEO controls the agenda and works closely with the National Tribal Caucus (NTC) to determine topics and speakers. During last year's TSP discussions at the RTOC meetings, the TSC Tribal representative from the respective region gave the presentation. Scott commented that it is the responsibility of the TSC Tribal representatives to relay information to the RTOCs; Mike Durglo has been excellent at informing the Region 8 RTOC about TSC activities. Scott hopes there will be funding available for a TSC member to attend the NTOC meeting. He added it would be a good idea for Jeff to approach the NTC about this issue so that Clay Bravo could advocate for TSC attendance. Patti agreed that the TSC should be proactive in contacting Clay about the TSC Tribal Co-Chair attending the NTOC meetings. Bob Hillger also thought that it was important for Jeff to be present at the NTOC to represent the TSC. Jeff said that he would be in Washington, D.C., at the First Stewards Symposium the same week as the NTOC and may be able to attend.

Tia thought that it was important to ensure that the TSC has representation on the NTC because the NTC also wants TSC updates. Monica explained that Lee Juan Tyler was the TSC representative to the NTC. Jeff said that Lee Juan's lack of participation on the TSC was an issue.

Finally, Jeff emphasized his concern about the lack of tribal input in TSC decision making. He stated the need for the Tribal Caucus to be included in the decision making (e.g., hiring of tribal consultants).

The TSC turned the discussion to the TEK workshop, and Jeff told the TSC members about the adaptation activities that the Grand Portage Chippewa was engaging in with Seth Moore. He emphasized that TEK refers to local knowledge (i.e., the "our" knowledge). Western science is an amalgamation of thousands of years of science from around the world. There is no true Western science; it should be called "modern science." He stated that many of the tribes are sharing their knowledge through song and dance at the First Stewards Symposium. He cited the Two Row Wampum in terms of addressing how climate change affects infrastructure in addition to ecology and the environment. David C. said that it would be useful for the TSC to have a sweeping definition of TEK; a definition should be developed or people will make one up themselves.

Bob Hillger thought that there should be a showcase of TSC activities at the workshop, potentially in the form of a poster during the poster session. Monica reminded the members to consider what format the workshop should take.

TRIBAL ECOAMBASSADORS TECHNICAL PLENARY SESSION

Tribal ecoAmbassador Project Presentations

Patti was excited to introduce the Tribal ecoAmbassador projects to the TSC. She introduced Marissa McGinnis, who directs the Tribal ecoAmbassador Program. Marissa thanked Patti for all of her help with the program, which was initiated by Administrator Jackson. Eight Tribal ecoAmbassador projects have explored a variety of issues on tribal lands, and each Tribal ecoAmbassador has motivated and inspired Marissa. She has learned how to move projects forward within EPA and how to work better with TCUs and tribal communities. A press release announcing the next Tribal ecoAmbassador Program solicitation was scheduled to be released that day. Her office is supporting six projects during the new program year, and the Toxics Release Inventory (TRI) Program is sponsoring two TRI-related projects. April Navling of the American Indian Higher Education Consortium (AIHEC) explained that she advocates the work with the TCUs, and she has been honored to work with the Tribal ecoAmbassadors during the past year. The promising program provides a unique learning experience.

Private Well Drinking Water Quality on the Turtle Mountain Band of Chippewa Indians Reservation Deborah Hunter, Tribal ecoAmbassador

Deborah Hunter explained that the University of Wisconsin compiles public data for each U.S. county and creates a health ranking. Rolette County, North Dakota, the county in which Turtle Mountain Community College resides, ranked 46 out of 46 counties in the state for mortality and morbidity. The county ranked 44th for all other factors, including community safety, tobacco and alcohol use, and access and quality to care. It is important to note, however, that the margin of error is 30 percent. Water quality has a significant effect on health, but it is not included in the University of Wisconsin ranking. It should be included, however, because natural and pollutant chemicals in drinking water may cause a variety of health-related problems, including circulatory problems (e.g., high blood pressure), lung and bladder cancer, gastrointestinal disease, and kidney and liver damage.

The National Primary Drinking Water Regulations provide primary standards for public water systems but do not regulate water from private wells. Many of the wells on the Turtle Mountain Indian Reservation have not been tested since they were constructed. This project focuses on these wells, and the students perform all of the tests, which have been approved and/or accepted by the Agency or are under EPA review. Water quality indicators to be analyzed include total coliforms, nitrites and nitrates, pH, hardness, turbidity, total chlorine, lead, radon and so forth. The project is investigating heavy metals, so the researchers decided to use atomic absorption. Deborah described the protocols for several of the tests used for the student learning-focused project. The students are responsible for recording all of the results. The group is trying to stay current in analyzing the samples, but the samples can be stored safely for up to

6 months if necessary. Currently, iron is the only chemical that has tested higher than the recommended EPA levels. It is necessary to determine whether iron has an effect on the other tests and adjust accordingly.

Future plans for the project are to continue sample collection from private wells to analyze drinking water quality, sending water from selected wells to a certified laboratory for testing (including radon testing) and validation, develop a GPS map of well sites, compare the project results to the results of the North Dakota Geological Survey, and develop a final report. Weather has been an issue, and the next analysis will include volatile organic compounds.

Macroepigenetics Intervention for Diabetes Prevention
Renee Dufault and Zara Berg, Tribal ecoAmbassadors

Renee Dufault explained that an analytical approach can be used to understand how environmental and dietary factors interact to regulate genes that protect health or make individuals more susceptible to disease. For example, environmental mercury exposure and high fructose corn syrup consumption can decrease *PON1* gene transcription, potentially increasing the harmful effects associated with organophosphate (OP) exposure (e.g., autism) because the gene is responsible for the breakdown of OPs. Mercury exposure through consumption, particularly fish, and atmospheric sources are associated with negative health effects, including insulin resistance, which increases the chance of developing type-2 diabetes, a disease of concern for the tribes. Additionally, mercury-exposed parents can give birth to insulin-resistant children, highlighting a transgenerational effect.

Zara Berg explained that the goals of the project were to: (1) provide a pathway of learning to support the development of research skills in students, (2) measure whether a pathway of learning can be used to reduce consumption of food commodities and ingredients that cause negative epigenetic changes, and (3) determine whether there is any change in student health status as a result of the macroepigenetics educational program. Macroepigenetics instruction was delivered online for 10 weeks and included nine modules of instruction, a weekly discussion board, and an embedded pre- and postsurvey. Students were required to complete research tasks. Students investigated sugar consumption in the United States and how it has changed between 1975 and 2009; high fructose corn syrup consumption has increased significantly during that time period. Students also examined pesticide exposure in the food supply by accessing U.S. Department of Agriculture pesticide data and discovered that OPs are found in food. The current average diet is chemically derived with high potential exposure to OPs and mercury.

Renee highlighted the results determining whether the pathway of learning was effective. In terms of its effects at reducing the consumption of foods that cause negative epigenetic changes, the students reported significantly reduced consumption of sugar; they also reported less red and processed meat consumption, indicating that the pathway of learning was effective at reducing consumption of food related to heart disease. In terms of consumption of foods that cause positive epigenetic changes, the students increased their fish and fresh vegetable consumption. Overall, the percentage of students who responded that they ate more healthily than compared to the previous year increased from 27.3 percent in the presurvey to 70 percent in the postsurvey. The researchers also employed noninvasive biomarkers to attempt to measure positive changes and found that the mean waist-to-hip ratio of the students had decreased. The researchers also asked questions on the pre- and postsurveys to determine whether the pathway of learning was effective at increasing student understanding of toxic food ingredients and found that understanding had increased. Finally, Renee and Zara highlighted a researcher-authored paper as well as a brochure, PowerPoint presentation and metabolic pathway drawing created by students that highlighted the sharing of knowledge that this project fostered.

ecoAmbassador Air Quality Monitoring Project
Mark Bauer and Joni Nofchissey, Tribal ecoAmbassadors

Mark Bauer explained that air quality in the Four Corners region is a problem. Despite the rural location, the rates of upper respiratory illnesses at the Northern Navajo Medical Center are five times greater as compared to the rest of the Navajo Nation Indian Health Service health centers. The problem likely is associated with two large coal-fired plants within 20 miles of the community. In the winter, the smog is highly visible near the ground because thermal temperature inversions keep the air pollution trapped in the basin. Common use of wood and coal stoves in residential houses exacerbates the problem. Finally, compared to the general U.S. population, American Indians suffer disproportionately from respiratory morbidity.

The project uses affordable and portable air quality monitoring equipment (M-PODs) that provide timely but not precisely accurate air quality information. Joni Nofchissey explained that the M-PODs are provided and designed by the University of Colorado (UC)–Boulder with input from the National Center for Atmospheric Research. Interns collect the data on a variety of factors (e.g., ozone, carbon dioxide) via the M-PODs and upload them to the UC-Boulder website so that the data can be downloaded for analysis. Results can be shared with affected communities to increase air quality via proactive air quality monitoring. The M-PODs are easy to use, read and access, and the easily navigated website possesses interactive interfaces that allow access to charts and graphs instantaneously. The data can be used as a baseline to support air quality research. Battery life, slow uploads as a result of slow campus Wi-Fi, data of limited accuracy and the need to keep a log are drawbacks of the device.

Joni highlighted some results that indicate that all three houses sampled for nitrogen dioxide exceeded the recommended healthy levels. The differing concentrations found at each house were expected based on the various heat sources used (woodstove, electric and natural gas). One of the houses was found to have carbon dioxide levels more than five times greater than the higher end of recommended levels, which might be a sign of other pollutants and could indicate how well a structure is ventilated. The project provided valuable feedback to the UC–Boulder engineers to further develop their system, and participation in EPA's Apps and Sensors for Air Pollution Workshop provided insight to developers, regulators and scientists regarding the experiences and challenges of community-based air quality monitoring. The students gained and shared experience in air quality monitoring, which also provided them motivation. Two summer interns will continue to collect air quality data and compare them to an area in Arizona. Future interns will learn to recalibrate the devices so that they do not need to be sent to UC-Boulder. Interns also will collect data from stationary monitors to groundtruth the M-POD readings. Finally, the interns will participate in community forums to share results and educate members on being proactive in improving personal air quality.

The M-PODs provide baseline data that offer a very broad overview of the air quality in residential homes and the community. The M-PODs' convenience offers a better understanding of local air quality. The baseline data will provide avenues and justification for in-depth air quality sampling and research, and the community will have a better understanding and awareness about air quality issues resulting from a variety of heating systems. The experiences of the staff and interns provided insight to the developers on how to improve air quality monitors. Finally, alternative heating sources (e.g., wind, solar, biomass) must be identified and evaluated to improve residential air quality. Mark explained that because the college is concerned with the area's air quality, and EPA is interested in mitigating air quality, work on alternative heating sources soon will be under way. The ORD will work with the community to obtain input about alternative sources; Navajo traditional knowledge is being implemented in policy areas as a result of this effort.

Assessing Sources of Contamination on the Lower Little Big Horn River on the Crow Reservation in Montana
Sara Plaggemeyer, Tribal ecoAmbassador

Sara Plaggemeyer explained that the Little Big Horn College was chartered in 1980 and designated as a land-grant institution in 1994. The college, with its 300 students, emphasizes student participation. Her project includes water quality monitoring that is focused on biological contaminants, coliforms and *Escherichia coli*; the project is supported by previous student-focused water quality monitoring projects. Three rivers on the Crow Indian Reservation are monitored, and they show significant differences in terms of microbial contamination. During the past 5 years, 22 students have monitored water quality; the current project includes four students who are trained on water quality, molecular biology and microbiology.

Water quality on the Little Big Horn River is a community-driven concern. Because results indicated a significant increase in *E. coli* at one of the sites, the researchers have focused on the lower end of the Little Big Horn River. The first step was to identify new sites for water sample collection. The establishment of these new sites allows the researchers to determine and track the sources of the contamination. The physical parameters analyzed include turbidity, total suspended solids, pH, conductivity and dissolved oxygen. Coliform and *E. coli* are detected with IDEXX Colilert®, which utilizes a most probable number approach. All of the analysis is performed at Little Big Horn College. The expected results of the project are to identify areas of high coliform and *E. coli* input, produce information that can be applied locally to address health issues, increase the students' familiarity with molecular techniques, and share information among researchers at Little Big Horn College. About one-third of the project has been completed, including the training portion and 30 days of sampling.

Investigation Into the Impacts of Oil Development on Groundwater Quality on the Fort Berthold Indian Reservation
Kerry Hartman, Tribal ecoAmbassador

Kerry Hartman provided background information on the Fort Berthold Indian Reservation. He shared that it is the home of the Mandan, Hidatsa and Arikara Nation, which has thousands of years of history. The reservation is composed of 2 million acres in North Dakota. The Three Affiliated Tribes, as the tribal nation also is known, have survived the small pox epidemic and flooding of their lands by the Garrison Dam; currently, the tribes are struggling with a crisis brought on by oil development. The community college on the reservation, Fort Berthold Community College, soon will be renamed the Nueta Hidatsa Sahnish College. The school, which was the third tribal college ever established, was accredited to offer Bachelor of Science (B.S.) degrees in 2011, including a B.S. degree in environmental science that focuses on remediation and cleanup. He gave a brief description of his project.

Creating Carbon-Negative Building Products From Local Recycled Materials
David Stone, Lucy Garcia and Richard Pablo, Tribal ecoAmbassadors; and Jane Latane, Vice President of Research and Development, Tohono O'odham College

Jane Latane described the Tohono O'odham Nation's reservation, which is composed of 2 million square acres in a hot, dry, mountainous climate; 15,000 of the 30,000 tribal members live on the reservation. Lucy Garcia and David Stone described the ecoAmbassador project, which resulted from the cleanup of millions of bottles, mostly beer, that litter the desert. The cleanup highlights the cultural issues of alcoholism and substance abuse. Richard Pablo added that recycling all of this material improves the community and the children's futures, and this project has provided him with the opportunity to give back to the community. The project combines culture, math and science at the ground level to teach children to be protective of their environment; they are the future leaders. Lucy explained that the glass was broken down by hand crushing for the previous 6 months; this taught her an appreciation for the process and

allowed her to reflect on the issue of alcoholism in the community. David S. added that a small built-to-order glass crusher that was purchased recently has the ability to crush 1 ton of glass per hour. Pavers and blocks are made with recycled glass and waste steel dust, which reduces landfill burden. Although there is a demand to sell the pavers, they need to be tested for durability. The recycled products are difficult and time-consuming to make, and it is a challenge to enter into the commercial market because of the amount of products needed. An automated system is needed to be commercially competitive. The current process is to collect bottles from the desert and the community, crush the bottles and sift the resulting glass by size, add the glass as aggregate to an iron-based mix, and make building products with the cement mix. Current products include blocks and pavers, slabs and sidewalks, outdoor furniture, walls and roofs, and houses and other buildings. The potential to build entire villages is present.

David S. highlighted with photographs several examples of the items that have been made from the recycled materials, including a cement bench created by using carbon dioxide to harden the glass aggregate that included iron carbonate and a honeycomb structure; the process is carbon negative. Carbon dioxide is a problem for the cement industry, and efforts have been made to develop alternate methods that are carbon neutral or negative. The cement matrix is promising, and the researchers will explore this further with federal and university partners. David S.'s first demonstration building using the process was a greenhouse. The method he used increased the range of the strength-to-weight ratio. To determine how to build in the desert, he examined Snaketown, an ancient village built by the progenitor of the Tohono O'odham Nation, the Hohokam, who lived from 300 to 1100 AD. They built structures in a manner similar to how other Southwest tribes (e.g., Anasazi) built their structures, with the thick-walled rooms acting as insulation chambers. The Casa Grande National Monument, built around 1300 AD, is a similar example. The Southwest is predicted to experience an intense, prolonged "megadrought," and it will be interesting to see whether the current cities in the region (e.g., Phoenix, Arizona; Los Angeles, California) survive. The Anasazi did not survive the drought they experienced 1,000 years ago.

Tribal ecoAmbassador Technical Poster Session

The TSC members engaged in more in-depth discussion with the ecoAmbassadors about their projects during the technical poster session. The session highlighted research results and outcomes in an interactive setting.

Tribal ecoAmbassador Working Lunch

The TSC members and Tribal ecoAmbassadors participated in a working lunch to network and continue discussion of the projects.

Next Steps: TSC-Tribal ecoAmbassadors Collaborations to Integrate TSPs Into Future Projects

Ted explained that the goal was to align the TSPs with future Tribal ecoAmbassador Program projects. Bob Hillger asked which entity manages the program, and Patti explained that AIEO funds each project for the academic year. Marissa stated that the month-long solicitation opens in July, and AIHEC is involved in the process. Michelle DePass approves the peer-review panel, which this year involves personnel from headquarters and the Regional Indian Program Coordinators. Michelle also reviews the applications. She reiterated that the press release for the upcoming year's program was being announced that day, and AIHEC also is promoting the solicitation. Bob Hillger asked whether the solicitation states that a partnership with EPA is required. Marissa explained that this year's solicitation will highlight potential partnership opportunities. Patti said that there had been discussion about limiting the topics to the TSPs, but the decision was made that this was too narrow a focus.

Richard said that the indigenous stories provide the students with meaningful information that they can grasp. When culture is brought together with science, it is made more meaningful and makes children

want to learn more. The children see new perspectives and obtain a better cultural perception of why things are the way they are.

An ecoAmbassador from Fort Peck Community College stated that she had received a deeper understanding of culture. There is a cultural problem of "siloing" programs. In addition, there is a great deal of rhetoric about natural resources and subsistence, but the base of subsistence, human breast milk, never is mentioned. She has performed work that correlated federal policies with birth outcomes in Indian Country. Women's status as a point of political intervention is necessary to improve birth outcomes in Indian Country. Also, it is important to note that adult disease begins in the womb. Beginning with the creation story and integrating TEK with cultural themes will help to improve the environment. It would be interesting to hold the TEK workshop at the Eastern Band of the Cherokee Nation because the tribe is involved in reproduction research. Additionally, TEK is embedded in language, so receiving input from language programs regarding these types of themes would be beneficial. Jeff agreed that this was needed and thanked the ecoAmbassador for her input.

Deborah said that it was necessary to incorporate culture into science. At the Region 8 RTOC meeting, Kim Greenwood presented about the USFWS TEK program, the goal of which is to educate USFWS biologists about TEK and integrate TEK into habitat research and species listings. Renee said that macroepigenetics involves the study of how diet and genes interact; these components must be brought together. If EPA can integrate toxicology and epigenetics, then it will be "ahead of the curve." These components should be added to risk assessment, and Indian Country is a good place to start. Ted said that there had been discussion within the Agency about incorporating epigenetics.

Marissa said that during the review process, the proposals could be considered in terms of how they tie into the TSPs; the reviewers will be considering how to partner with EPA. Ted thought that it would be good to obtain different tribal perspectives for the projects. David S. added that there are many problems to solve. Starting an "eco village" approach from scratch would be an interesting experiment to determine whether integrating many positive approaches at once would be successful. EPA should be proactive in showing how all of the elements (e.g., materials, energy, water) can work together, perhaps by running experimental villages to determine whether all of the elements can work in the 21st century. Ted thought that this was a good point and explained that a number of programs attempt to address these issues, but they are time intensive, and some programs have experienced complications. There are grand opportunities available to work with other agencies as well, and EPA is pursuing these, although it might take time to see results.

David S. pointed out that according to some political thinkers, the free market is a system that will encourage environmental solutions to be brought forth. He did not see how the system could self-correct, however, so a radically different approach is needed. Jeff said that the tribes do not want the government to tell them how to live, and the tribes might consider being told to take an eco village approach as the government doing telling them how to live. There are lessons to be learned from other cultures and tribes, although some are very idealistic. David S. thought that a combination of ancient principles that worked across a long period of time and integrated with the appropriate green techniques and agricultural approaches could be the fusion for which people are searching. Perhaps even the best fusion, however, will not work given current population growth rates and resource depletion. He cited the example of an aboriginal woman who said, "If you are here to help, don't bother; if our liberation is codependent, then let's talk."

Bob Hall said that management is the key because relocation is not possible for the tribes as it once was in the past. The objective is to learn to manage the ecosystem. A participant commented that the attempt is being made to merge a government Agency with culture, and the TSC is attempting to increase TEK, which always has existed. The problem is conversing between two different cultures. The TSC works in

whatever form necessary to bring about positive change, but it is important to understand where the tribes are coming from; adaptation is not the problem, as the tribes have adapted for millennia to different environmental and social situations. The tribes would like tools that benefit them with the acknowledgment that the EPA-tribal relationship is a government-to-government interaction. Wherever the TEK workshop is held, it is important to take the time to understand the host tribe's culture and language. A good time to hold the workshop is during a change of season because that is a time that the tribes recognize as a time of change; solstice, however, is not a good time to hold the workshop.

Patti agreed that it was important for the TSC to learn about the host tribe's culture. Bear added that cultural training had been provided to the TSC members in the past, but because the membership has changed considerably since then, it is a good idea to revisit cultural training so that the tribal and EPA cultures can work well together and move forward. Curtis added that it is very important to include language in the effort. He has found that EPA representatives listen, so now it is time for the tribal representatives to share their perspectives. As a scientist, he has received a scientific education, and as a tribal member, he has TEK knowledge; these must be connected in a holistic (spiritual) manner. The TSC is bridging this gap by working together. The tribes understand energy (spirit); for example, clean water releases more positive energy than contaminated water.

Ted outlined the steps to move forward with the effort of aligning the TSPs with the Tribal ecoAmbassador projects: (1) invite EPA TSC members to serve on the review panel, and (2) look for opportunities to collaborate with EPA.

OTHER TSC BUSINESS

Framework for the TSC Fall Meeting/TEK Workshop

The TSC members determined by the end of the session that the date for the TEK Workshop would be the week of June 17, 2013.

Ted noted the importance of location in terms of the cultural value. Bob Hillger commented that attendance can be facilitated if the meeting is held near a major airport. Orville Huntington said that in terms of participation from Alaska Natives, it is difficult to travel anywhere, so traveling to the East Coast would not be much more difficult than traveling to Seattle. The TSC members decided on three potential locations for the TEK workshop: (1) Eastern tribal locations, (2) Haskell, and (3) the Eastern Band of the Cherokee Nation (Cherokee Language Immersion Academy). Neil will investigate the Eastern tribal locations, Denise and Brenda will explore the MOU with Haskell in terms of a funding mechanism, and Katie will investigate the Eastern Band of the Cherokee Nation as a potential host. They will report to Monica by the end of June. Additionally, USET can be used as a resource to identify elders who should present at the workshop.

After much discussion, the TSC decided to hold more than one TEK workshop; attendance at the first workshop would be focused on the TSC. Monica asked what the goals and next steps of the workshop would be now that the focus had been changed to TSC-only participation. Bear thought that a good first step would be for each of the caucuses to share its culture with the other to better understand each other even though the TSC is educated to understand TEK. This will provide the TSC with the opportunity to solidify what TEK is and tie it to science, which makes the topic unique to this group. Creating this identity will help with the next step and provide the members with the opportunity to refine the next workshop for a larger audience. The following step would be to host a larger version of the workshop, designed as a forum, with those external to the TSC. Products should be developed at both TEK meetings. One product of the first TEK workshop could be to develop a plan for Phase 2 of the TEK effort. Bob Hillger said that the products need to be disseminated, which could be Phase 2 or Phase 3 of the effort.

Scott said that the presentation that Kim Greenwood of USFWS had provided to Region 8 was outstanding, and she would make an excellent addition to the TEK workshop. Denise indicated that she already was included on the list of presenters that had been developed. Monica said that she would send the presentation to the TSC members and Marissa via email.

The TSC members discussed the next face-to-face meeting. Brenda said that the TSC needed to be proactive about continuing some of its activities without the need for travel. Patti said that Adobe Connect could be used to plan the workshop. Bear said that many of the tribes do not have the capability to be involved in virtual meetings, and webinars tend to experience technical difficulties. Jeff agreed that meeting in person is helpful for carrying out TSC business, but he would be open to the use of additional technology to make the monthly conference calls more productive. Patti thought that it would be a good idea to fill the void between face-to-face meetings by using technology. Monica agreed that using Adobe Connect would be helpful when the TSC discusses the remainder of the TSC Overview Document.

Brenda explained that she had been asked by her management to discuss this topic with the TSC because her travel might not be supported if it cannot be justified. If the TSC meets in a regional office, the region will have video capability. Denise said that the tribal representatives could travel to their regional EPA offices, but Jeff did not agree because this would place the burden of travel solely on tribal members. Bob Hillger explained that during the first 3 years of the TSC, the members determined that the meetings should be held in-person on tribal lands and involve host tribes and meetings with elders for a variety of important reasons. This format should not be lost.

Jeff said that efficiency is doing the same with less; conservation is doing less with less. Doing less is a disservice to this important group. The TSC involves a government-to-government relationship, and the tribes are not on equal footing with technology compared to the Agency. Because there are twice as many EPA representatives compared to tribal representatives, the tribal voices can be lost. They definitely would be lost if technology was implemented instead of face-to-face meetings.

Patti thought that subcommittees could be formed to improve the productivity of the monthly conference calls. Bear said that the only way that subcommittees are successful is if the members are willing to perform the necessary work, and this has not worked out well in the past. Perhaps each conference call could focus on accomplishing one item, with homework for the members to complete before the call. Attendance also is an issue; the members must participate to accomplish things. Beth said that selective use of Adobe Connect when the TSC is reviewing documents would make the conference calls more productive. She agreed that pre-work was necessary to increase productivity.

Ted turned the focus back on discussion of the next meeting for the fall of 2012. The TSC members determined that the meeting would take place during the week of December 3, 2012, near Seattle. Jeff will speak to Jim Woods about his offer to host the meeting in Region 10, and the TEK tie-in can begin at the fall meeting. The Suquamish Tribe has facilities that may be able to accommodate the TSC.

Day 2 Wrap Up

Bear recessed the meeting at 4:19 p.m.

Thursday, June 14, 2012

The Pyramid Lake Paiute Tribe hosted the TSC members on its reservation, providing tours of the water quality laboratory, Dunn Hatchery and Pyramid Lake. The meeting was adjourned at the close of the trip.

TSC Action Items

- In terms of locations for the TEK Workshop, the following members will report to Monica their findings by the end of June:
  - Neil will investigate Eastern tribal locations.
  - Denise and Brenda will explore the MOU and potential funding mechanism for Haskell.
  - Katie will explore the Eastern Band of the Cherokee Nation as a potential host.
- Monica will send via email Kim Greenwood's TEK PowerPoint presentation to the TSC.